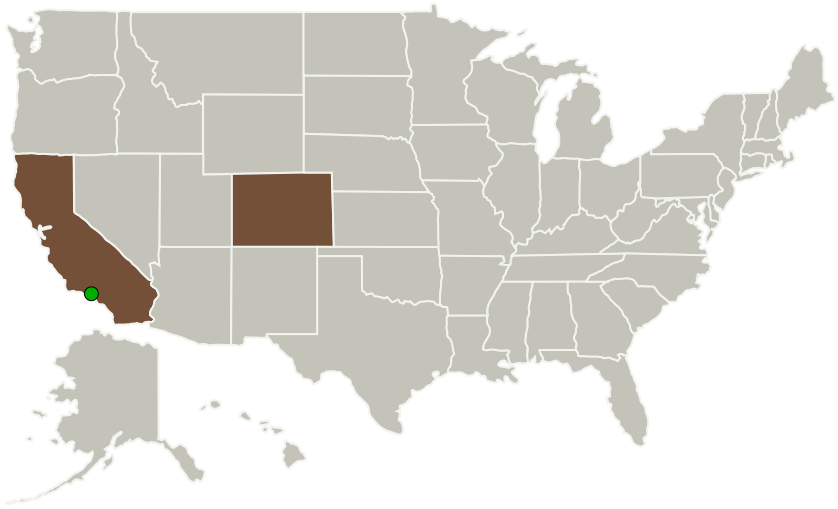
# ROC-Rib Deployable Ka-Band Antenna for Nanosatellites, Phase I

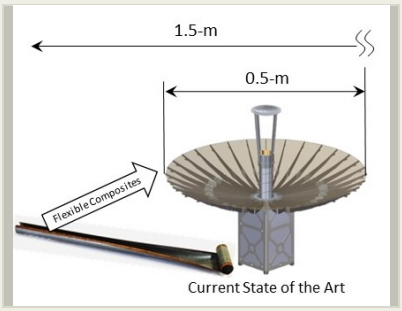
Completed Technology Project (2015 - 2015)

## Project Introduction

In these days of tight budgets and limited funding, NASA is constantly looking for new ways to reduce development time and costs of future spacecraft. This is the driving spirit behind NASA's increasing interest in the CubeSat platform, and the vision that is guiding development and demonstration of higher-risk technologies that can eventually lead to low-cost atmospheric science from CubeSats. For example, a tantalizing next-generation CubeSat system would combine a high-gain deployable antenna with a high-frequency Ka-band transponder to support very high bandwidth communications on the order of 10s of Mbps and/or very high-resolution radiometric remote sensing of atmospheric phenomenon. To address this need, Roccor proposes to develop a Ka-band deployable mesh antenna that can package within a 2U-3U CubeSat volume and deploy to diameters of 0.8-1.5m. The so-called "ROC-Rib" antenna employs a backing structure that is a hybrid wrap-rib/perimeter-truss design. A net supports a reflective mesh while the entire assembly provides the structural depth and surface accuracy needed for Ka-band operation.

## Primary U.S. Work Locations and Key Partners



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## Table of Contents

**Small Business Innovation Research/Small Business Tech Transfer**

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| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| Roccor, LLC | Lead Organization | Industry | Longmont, Colorado |
| Jet Propulsion Laboratory(JPL) | Supporting Organization | NASA Center | Pasadena, California |
| Tendeg LLC | Supporting Organization | Industry<br>Small Disadvantaged Business (SDB) | Louisville, Colorado |

| Primary U.S. Work Locations | |
|---|---|
| California | Colorado |

## Project Transitions

**June 2015:** Project Start

**December 2015:** Closed out

**Closeout Summary:** ROC-Rib Deployable Ka-Band Antenna for Nanosatellites, Phase I Project Image

**Closeout Documentation:**

- Final Summary Chart Image*(https://techport.nasa.gov/file/139298)*

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Roccor, LLC

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

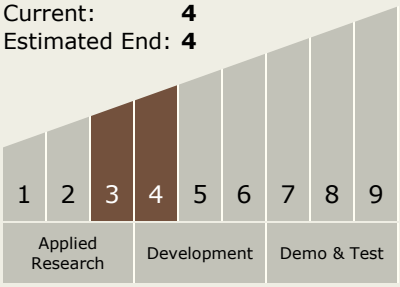
Carlos Torrez

**Principal Investigator:**

Gregg Freebury

## Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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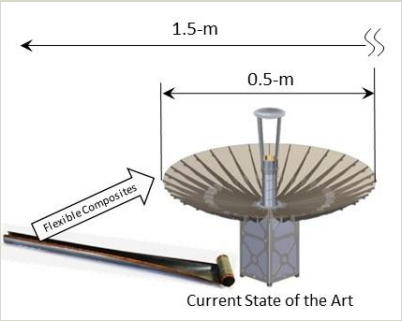
## Images




**Briefing Chart Image**
ROC-Rib Deployable Ka-Band Antenna for Nanosatellites, Phase I *(https://techport.nasa.gov/image/133386)*

## Technology Areas

**Primary:**

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System